# MENTAL RETARDATION WITH COMPLEX PARTIAL SEIZURE IN A CASE OF CROUZON SYNDROME

**Amit Bhadu, Naren Amin, Chetan Shah, Prakash Mehta, Kamlesh Patel, Prema Ram Choudhary**

**ABSTRACT**

Crouzon's syndrome is a rare autosomal dominant skeletal disorder caused by multiple mutations in the fibroblast growth factor receptor 2 (FGFR2) gene. Two genes are known to be associated with Crouzon syndrome, FGFR2 and FGFR3. FGFR stands for fibroblast growth factor receptor. These genes are involved in the growth of the skull bones. The FGFR2 gene is the most common gene associated with Crouzon syndrome. (1) Since human skull is made up of many bones, joined by sutures. The fusion of sutures takes place after the complete growth of the brain. If any of these sutures closes early, it may interfere with the normal growth of the brain and results in various syndromes, even though most people with Crouzon syndrome (97%) do not have mental retardation or learning problems. Only in 3% cases fusion of sutures in early life before the development of brain exerts pressure on the skull as well as on the developing brain itself and May results in an abnormal development and functioning of growing brain. We found such a rare case of Crouzons syndrome having the symptoms of headache, convulsions (complex partial seizures) associated with mental retardation which is not commonly seen in this syndrome.

**KEY WORDS:** Crouzons syndrome, Complex partial seizures, Craniosynostosis, Mental retardation.

## INTRODUCTION

Crouzon syndrome accounts for approximately 4.8% of all cases of craniosynostosis, with the prevalence of approximately 1 per 25,000 live births worldwide[1]. In about 25-50% of people Crouzon syndrome is sporadic. This means there is no family history of the syndrome and it is unlikely to occur again in another pregnancy. Crouzon syndrome is an autosomal dominant condition, so if a parent has Crouzon syndrome they have a 50 % (1 in 2) chance for each pregnancy of having a child with Crouzon syndrome[2].Premature synostosis commonly involves the sagittal and coronal suture and sometimes involve Lambdoidal sutures. The order and rate of suture fusion determines the degree of deformity and disability[3,4]. In this article we present Crouzons syndrome having the symptoms of headache, convulsions (complex partial seizures) associated with mental retardation which is not commonly seen in this syndrome.

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## CASE HISTORY

A 20-year-old female child visited the Department of Psychiatry with complain of headache, convulsions and difficulty in performing skilled activities. Routine checkup was done in departmental outpatient clinic (OPD) and written consent was taken from the patient. Her appearance was different from other normal healthy females of her age, with protruding eyes, enlarged calvarium, hypertelorism protruded lower jaw, deep and narrow high arched palate, missing teeth (hypodontia), crowding of teeth and anteriorly directed uvula. Patient's intelligence quotient (IQ) was found to be in the range of 55-65% (mild degree of mental retardation). History from the parents revealed that these features started developing since she was a small child, and the severity has gradually increased. No positive familial history was obtained.

On examination and investigation following features were identified:

Clinical finding were exophthalmos, reduced vision, strabismus, hypertelorism, bilateral chronic suppurative otitis media (csom), deviated nasal septum, enlarged calvarium, protruded lower jaw, relatively large mandible ,retruded maxilla, resulting in midface retrusion, deep and narrow high arched palate, missing teeth (hypodontia ), crowding of teeth, dental aplasia present, and anteriorly directed uvula. Radiographs of the skull (lateral view) shows a hammered-silver ('beaten metal/ copper beaten') appearance was seen in the regions of the skull due to compression of the developing brain on the fused bone and thinned out posterior clinoid. (Figure-1). Incidentally noted findings are forward protruded mandible and crowding of teeth. (Figure-1, 8, 9 & 10). X-ray PNS shows silver beaten appearance in calvarium and non pneumatization of frontal sinuses. (Figure-2). CT scan brain bone

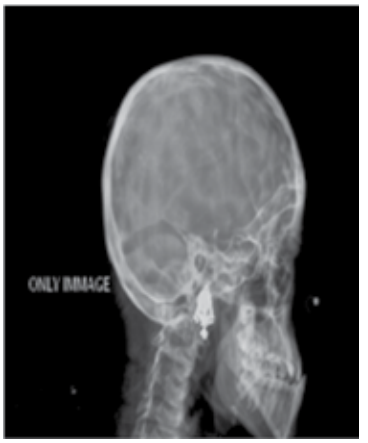



Figure-1

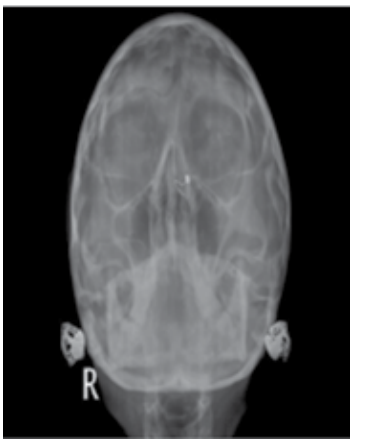
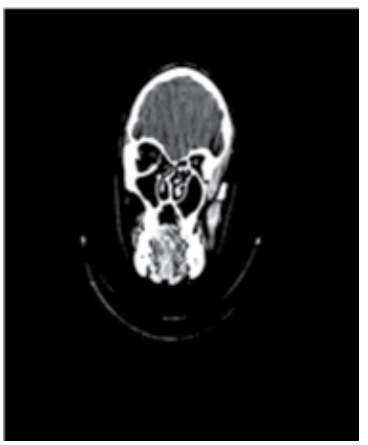



Figure-2



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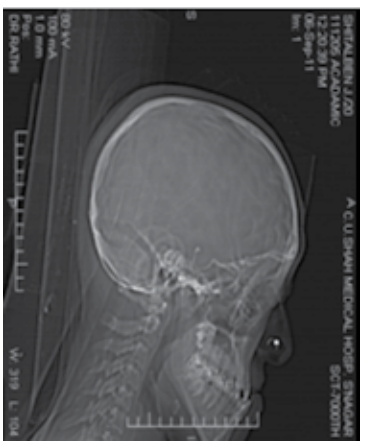


Figure-4

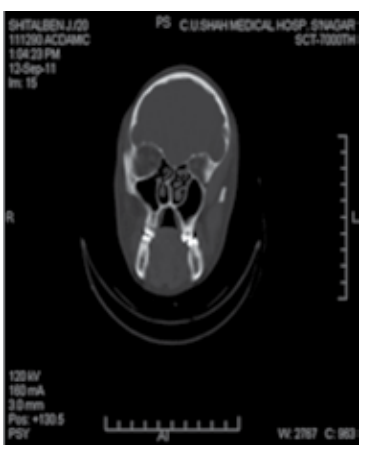



Figure-5

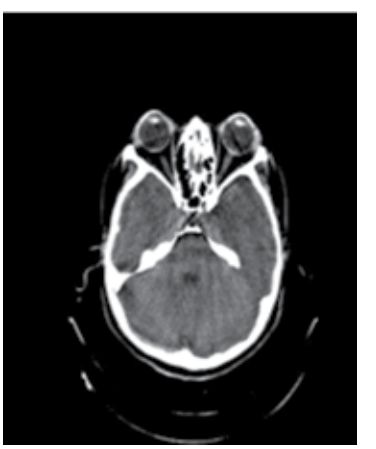


Figure-6

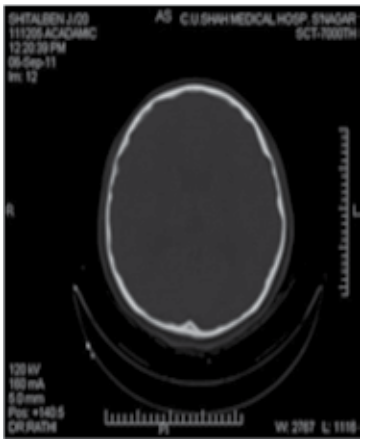


Figure-7

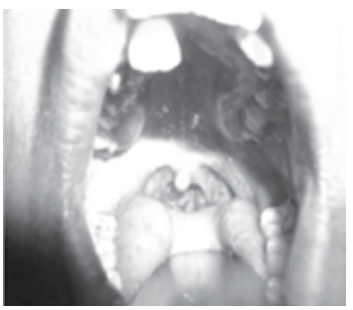
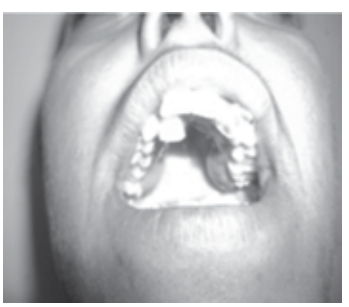


Figure-8



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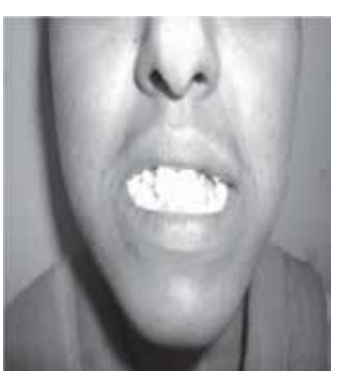

Figure-10

Figure-11

Figure-12

Figure-13

window image shows diffusely tinned out skull bones due to pressure effect of gyri. (Figure-7).CT PNS coronal images shows narrow and high arched palate and Rt sided deviated nasal septum. (Figure-3,5).CT orbit axial image shows presence of mild forward protruded both eyeball. (Figure-6).CT brain bone window images shows fused sutures. Awake EEG recording was done using 10-20 international electrodes system which shows spike and slow wave in left frontal and temporal lobe which suggests focal seizures. During convulsions unilateral upper and lower limb (right side) tremor, twitching of face (right side) was also observed and clinically correlated. (Figure-13)

### *TREATMENT PLAN*

A syndrome due to the complexity of symptoms always demands a multidisciplinary approach for successful outcome. The aim of psychiatric treatment in this case is to relieve the headache and complex partial seizures.

1. Patient is treated with Amitryptiline (10 mg/day) for headache and anti epileptic drugs-Carbamazepine 200 mg/day) for focal seizures.
2. Occupational therapy and psychotherapy.
3. Family counseling regarding patient's future life, marriage and family planning.
4. ENT surgery for CSOM and DNS.
5. As CSF pressure is within normal limits so no need of shunting to reduce pressure.
6. Training in skilled activities to run better life independently.
7. Dental opinion for crowding and hypodontia.

## DISCUSSION

In 1912, a French neurologist, Octave Crouzon first described this syndrome in a mother and son with the characteristic Triad of calvarial deformities, facial anomalies, and exophthalmos. Similar characteristic features of varying degrees were evident in this patient[5,6]. Crouzon's syndrome is caused by mutation of the FGFR2 gene on chromosome 10q25-10q26 [1]. Mutation of the FGFRgene is also responsible for other craniosynostosis such as Apert's, Pfeiffer's, Jackson-Weiss', and Saether-Chotzen's syndromes [7] rarely, acanthosis nigricans may coexist with CS and is caused by mutation in the trans-membrane region of the FGFR3 gene (locus 4p16.3)[8]. Crouzon's syndrome has no racial or sex predilections. However, when the craniosynostosis is of sagittal or metopic types, the predominance increases in boys, while coronal craniostenosis is more common in girls, as observed in this patient[9]. Premature fusion of the cranial sutures results in craniosynostosis, and this initiates changes in the brain and adjoining structures, such as increase in intracranial pressure, reduced orbital volume, exophthalmos (proptosis), severe maxillary hypoplasia and occlusal derangement [10]. Complications of Crouzons syndrome may include conjunctivitis or keratitis, luxation of the eye globes, exotropia, poor vision due to optic atrophy and corneal injury, blindness. Frequent headaches, seizures, mental deficiency, increasing hydrocephaly, conductive hearing deficit, upper airway obstruction develop secondary to septal deviation, midnasal abnormalities, choncal abnormalities and nasopharyngeal narrowing, Others include nystagmus, iris coloboma, aniridia, anisocoria, corectopia, microcornea, megalocornea, keratoconus, cataract, ectopia lentis, blue sclera and glaucoma[11]. Prognosis depends on severity of malformation. Innovations in craniofacial surgery have enabled patients to achieve their full potential by maximizing their opportunities for intellectual growth, physical competence and social acceptance. Patients usually have a normal lifespan.

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